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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,725	01/15/2004	Yasuhiro Ueyama	L8501.03101	4590

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EXAMINER
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PARSONS, THOMAS H

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 12/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/757,725

Applicant(s)

UEYAMA ET AL.

Examiner

Thomas H. Parsons

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) 8-52 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 January 2004 and 21 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of claims 1-7 in the reply filed on 14 November 2006 is acknowledged. The traversal is on the ground(s) that no unduly extensive or burdensome search would be required to examine the claims of the various groups and species in the same application. This is not found persuasive because:

The instantly claimed inventions are independent or distinct for the reasons previously given and have acquired a separate status in the art in view of their different classification, require a different field of search.

The requirement is still deemed proper and is therefore made FINAL.

### ***Specification***

2. The disclosure is objected to because of the following informalities:

Page 19, line 14, after "is selected", suggest inserting --in step 1311--.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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4. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claims 1 and 7:** The addition of the word “type” to an otherwise definite expression (e.g., polymer electrolyte membrane fuel cell) extends the scope of the expression so as to render it indefinite MPEP 2173.05 (c). Claims 2 and 6 are rejected as being dependent upon base claim 1.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-2 and 5-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Iwasaki et al. (7,091,149).

**Claim 1:** Iwasaki et al. disclose in Figures 1, 2 and 4 a method of producing an electrode of a polymer electrolyte membrane type fuel cell comprising a polymer electrolyte membrane (4), an electrode (2, 3) contacting the polymer electrolyte membrane and including a gas diffusion layer (6b, 6a) and a catalyst layer 32b, 32a) provided in contact with the polymer electrolyte membrane, and a separator (8a, 8b) provided in contact with the gas diffusion layer, the method comprising:

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- (a) providing a polymer film (102, and water-repellent layer 30a, 30b formed of a first paste comprising a polymer film of polytetrafluoroethylene and carbon);
- (b) providing a gas diffusion layer (base 6a, 6b of carbon paper, carbon cloth or the like);
- (c) providing a paste (a second paste) including at least a carbon powder having a catalyst supported thereon mixed in a solvent,
- (d) spreading the paste over polymer film to provide a coated support (Figure 2 has construed as showing the second paste (i.e. the catalyst paste as spread over the polymer film (the water-repellent layer) and subsequently covered with polymer film 102 during drying),
- (e) drying the coated support to evaporate solvent to form a catalyst layer (32a, 32b) on the support 30a, 30b),
- (f) layering the gas diffusion layer and the catalyst layer with one another to form an electrode (24, 26); and
- (g) controlling a cracking occupation area on the electrode to a predetermined tolerance by controlling at least one of (a) a thickness of said catalyst layer formed in step (e)(the recitation on col. 12: 48-50, "... after the second paste is coated to a *predetermined thickness* on the water-repellent layer" has been construed as controlling thickness), (b) a kind of carbon in the carbon powder having the catalyst supported thereon (i.e. catalyst to carbon powder ratio)(col. 14: 63-col. 15: 2 has been construed as anticipated controlling the catalyst to carbon powder ratio), and (c) a drying rate of the coated support in step (e)(col. 5: 7-12 and col. 12: 40-41). See also col. 10: 55-col. 13: 43.

**Claim 2:** Iwasaki et al. disclose that the tolerance of the cracking occupation area is not greater than about 25% (abstract, col. 4: 3-5, and col. 13: 35-39).

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**Claim 5:** The recitation “wherein the polymer electrolyte membrane type fuel cell is used as a household fuel cell” has been considered, and construed as a limitation that adds no additional structure to the cell. However, because cell of Iwasaki et al. is structurally the same as that instantly claimed, it would inherently be capable provided the claimed use.

**Claim 6:** Iwasaki et al. disclose that the catalyst is a noble metal catalyst (i.e. platinum which is the same as that instantly claimed).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki et al. (7,091,149) as applied to claim 1 above, and further in view of Sompalli et al. (6,524,736).

Iwasaki et al. are as applied, argued, and disclosed above, and incorporated herein.

**Claim 3:** Iwasaki et al. do not disclose the specific thickness, wt% platinum or the drying rate.

Sompalli et al. disclose that the thickness is controlled to be from about 10  $\mu\text{m}$  to about 25 $\mu\text{m}$  (col. 10: 67-col. 11: 6), the kind of carbon having the catalyst supported thereon is carbon having from about 5 wt % to about 20 wt % of platinum supported thereon (5 to 80 wt% as per col. 10: 24-35). As to the drying rate of the solvent of about 2.5  $\text{mg}/\text{cm}^2 \cdot \text{min}$  to about 20  $\text{mg}/\text{cm}^2 \cdot \text{min}$ ., Sompalli et al. on col. 9: 31 disclose, “...Controlling the content of non-wetting solvent in

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the slurry is very important as it determines the rate of drying of the catalyst layer..." Therefore, it would have been within the skill of one having ordinary skill in the art at the time the invention was made to have determined the drying rate depending upon the type and concentration of solvent.

**Claim 4:** Iwasaki et al. do not disclose adjusting the drying rate of the solvent by controlling at least one of the kind of solvent and a drying temperature.

Sompalli et al. disclose in Figure 5 drying a coated support to evaporate the solvent to form the catalyst layer on the support wherein adjusting the drying rate of the solvent comprises controlling at least one of the kind of solvent and a drying temperature (col. 7: 33-40). See also col. 9: 31-35.

**Claim 7:** Iwasaki et al. does not disclose that the carbon powder is finely divided.

Sompalli et al. disclose on col. 5: 13-17 that the carbon powder is finely divided. See also col. 6: 63-col. 7: 4.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Iwasaki et al. by incorporating the method steps of Sompalli et al. because both are concerned with electrode cracking and Sompalli et al. teach method steps that would have provided a more robust electrode by preventing electrode shrinkage and subsequent cracking of the electrode thereby improving the overall performance of the fuel cell.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas H. Parsons whose telephone number is (571) 272-1290. The examiner can normally be reached on M-F (7:00-4:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
PATRICK JOSEPH RYAN  
SUPERVISORY PATENT EXAMINER

Thomas H Parsons  
Examiner  
Art Unit 1745

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